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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte GAKU MINAMIHARA, YOSHIKUNI TATEYAMA,
HIROYUKI YANO, TOMOO KOUMURA, and KOU HASEGAWA

Appeal 2009-012991
Application 10/771,060
Technology 2800

Before MAHSHID D. SAADAT, CARLA M. KRIVAK,
and BRADLEY W. BAUMEISTER, *Administrative Patent Judges*.

SAADAT, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from the rejection of claims 11-18 and 20. Claims 1-10 have been withdrawn from consideration and claim 19 has been canceled. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

STATEMENT OF THE CASE

The Invention

Appellants' invention relates to a method of manufacturing semiconductor devices including a polishing treatment using a Chemical Mechanical Polishing (CMP) pad. (*See generally* Spec. 6:8-22).

Claim 11 is illustrative of the invention and reads as follows:

11. A method of manufacturing a semiconductor device, comprising:

forming a treating film above a semiconductor substrate; and

subjecting said treating film to a polishing treatment using a polishing pad disposed on a turntable while feeding a slurry containing abrasive grain onto said treating film, said polishing pad having a compression elastic modulus ranging from 300 to 600 MPa and comprising a matrix, and cells and/or a recessed portion-forming material both having an average diameter ranging from 0.05 to 290 μm , dispersed in said matrix, and occupying a region ranging from 0.1% by volume to 5% by volume based on an entire volume of said pad, said matrix having a major surface which faces said treating film and having a roughness of 5 μm or less, wherein the range of the compression elastic modulus of the polishing pad on the turntable is satisfied.

The Examiner's Rejections

The Examiner relies on the following prior art in rejecting the claims:

Jang	US 5,702,977	Dec. 30, 1997
Burke	US 2002/0098789 A1	July 25, 2002
Saka	US 6,458,013 B1	Oct. 1, 2002
You	US 6,663,787 B1	Dec. 16, 2003
Shimagaki	US 6,953,388 B2	Oct. 11, 2005

Claims 11 and 20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Shimagaki, Burke, and Saka.

Claims 12-16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Shimagaki, Burke, and Saka, in view of You.

Claims 17 and 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Shimagaki, Burke, and Saka, in view of Jang.

Appellants' Contentions

With respect to the rejection of claims 11 and 20, Appellants do not dispute the teachings of Shimagaki and Burke and merely challenge the Examiner's reliance on Saka for teaching the claimed polishing pad having a compression elastic modulus between 300 and 600 MPa (Br. 6). Appellants specifically contend that:

Saka discloses use of a Rodel IC1400 commercial composite pad, consisting of two layers -- namely, "a micro porous polyurethane top layer (Rodel IC1000) and a high density urethane foam as underlayer." Saka, col. 11, lines 54-60, emphasis added. Saka discloses that the room temperature elastic modulus of the top pad (*i.e.*, the Rodel IC1000) is 500 MPa, but the room temperature elastic modulus of the composite pad (*i.e.*, the Rodel IC1400) is 60 MPa. *Id.* Saka discloses use of the composite pad, and not solely the top pad, in polishing experiments.

Br. 6.

Appellants conclude that the elastic modulus of 60 MPa is outside the claimed range of 300 to 600 MPa (*id.*).

Appellants further point out that while the top layer or Rodel IC100 pad has a modulus of 500 MPa, this pad is not disposed on the turntable, as recited in claim 11 (Br. 7). Appellants point to the foam underlayer in Saka and assert that the presence of this underlayer pad disposed on a turntable results in the composite pad having an elastic modulus of 60 MPa, which falls outside the claimed range (Br. 9).

With respect to the remaining claims, Appellants provide arguments that are essentially similar to those presented for claim 11 and assert that

neither You nor Jang cure the deficiency of Saka (Br. 10-12), allowing those claims to fall with their base claim. Therefore, we select claim 11 as the representative claim. *See* 37 C.F.R. § 41.37(c)(1)(vii).

ISSUE

Has the Examiner erred in rejecting claim 11 as being obvious over Shimagaki, Burke, and Saka because Saka does not teach or suggest “a polishing pad disposed on a turntable ... having a compression elastic modulus ranging from 300 to 600 MPa?”

ANALYSIS

We have reviewed the Examiner’s rejections in light of Appellants’ arguments that the Examiner has erred. We disagree with Appellants’ conclusions. As stated by the Examiner (Ans. 9), the claimed polishing pad disposed on a turntable does not necessarily mean that the pad is in contact with the turntable. In other words, the claim does not preclude a polishing pad that is indirectly disposed on a turntable such as the polishing pad of Saka, which is on a turntable with a foam layer disposed between the pad and the turntable. Therefore, the Examiner, giving the claim its broadest reasonable interpretation consistent with the Specification, *In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997), properly relies on column 11, lines 54-60 of Saka for disclosing a polishing pad having the disputed modulus of elasticity (Ans. 9). As such, we agree with the Examiner characterizing the micro porous polyurethane layer (Rodel IC100) of Saka, which is disposed on the turntable through a foam underlayer and has an elastic modulus of 500 MPa, as the claimed polishing pad.

Appellants' analysis of the elastic modulus of the composite pad notwithstanding, it is apparent from the cited portions in column 11 that only the top layer contacts the wafer to perform the polishing process. In other words, the foam underlayer is not a part of the porous polyurethane Rodel IC100 "polishing pad" used for the polishing treatment. Therefore, we disagree with Appellants' position (Br. 6-7) and conclude that Saka discloses a polishing pad having a compression elastic modulus of between 300 and 600 MPa, as recited in claim 11.

CONCLUSION

The Examiner did not err in rejecting claim 11 as being obvious over Shimagaki, Burke, and Saka by finding that Saka teaches or suggests "a polishing pad disposed on a turntable ... having a compression elastic modulus ranging from 300 to 600 MPa."

DECISION

We affirm the Examiner's decision rejecting claims 11-18 and 20.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

ELD